

## CLAIMS

What is claimed is:

1. A method for operating a proximity sensor comprising:  
providing a performance reference defining a relationship between a parameter of a sensor signal and a characteristic of an object to be detected;  
deriving a function that specifies deviation of performance of the proximity sensor from the performance reference;  
providing a threshold value for the parameter;  
thereafter, operating the proximity sensor to produce the sensor signal;  
employing the function to normalize the sensor signal produced by operating the proximity sensor to produce a normalized signal; and  
comparing the normalized signal to the threshold value to determine whether an object is present.
2. The method as recited in claim 1 wherein the parameter is how many cycles of the sensor signal which exceed a threshold level.
3. The method as recited in claim 1 wherein deriving a function comprises:  
characterizing performance of the proximity sensor to develop sensor data  
defining a relationship between the parameter of the sensor signal produced by the proximity sensor and the characteristic of the object; and  
deriving the function based on deviation of the sensor data from the performance reference.

4. The method as recited in claim 3 wherein the function is an equation defining the relationship between the sensor data and the reference performance data.

5. The method as recited in claim 1 wherein the function is a gain factor indicating deviation between the sensor data and the reference performance data.

6. The method as recited in claim 5 wherein the parameter of the sensor signal is a count of cycles of the sensor signal which exceed a threshold level; and employing the function to normalize the signal comprises multiplying the count of cycles by the gain factor.

7. The method as recited in claim 6 wherein providing a threshold value comprises transferring data from another proximity sensor.

8. The method as recited in claim 1 further comprising defining a reference distance value; and wherein providing a threshold value comprises employing the reference performance data and the reference distance value to define the threshold value for the characteristic of an object to be detected.

9. The method as recited in claim 8 wherein defining a reference distance value comprises obtaining a value from another proximity sensor.

10. A method for operating a proximity sensor comprising:

providing reference performance data defining a relationship between a numerical value produced from a sensor signal and distance to an object to be detected;

characterizing performance of the proximity sensor to develop sensor data defining a relationship between a numerical value produced from the sensor signal of the proximity sensor and distance to an object to be detected;

deriving a function that specifies deviation of the sensor data from the reference performance data;

thereafter, operating the proximity sensor to produce a given numerical value;

employing the function to normalize the given numerical value, thereby producing a normalized value; and

determining, in response to the normalized value, whether an object is present.

11. The method as recited in claim 10 wherein the numerical value is how many cycles of the sensor signal exceed a threshold level.

12. The method as recited in claim 10 wherein the function is an equation defining the relationship between the sensor data and the reference performance data.

13. The method as recited in claim 10 wherein the function is a gain factor; and employing the function comprises multiplying the given numerical value by the gain factor.

14. The method as recited in claim 10 further comprising defining a reference distance value, and employing the reference performance data and the reference distance value to define a threshold level for the numerical value; and wherein determining whether an object is present also is in response to the threshold level.

15. The method as recited in claim 14 wherein defining a reference distance value comprises obtaining a distance value from another proximity sensor.

16. A method for operating a proximity sensor comprising:

- providing reference performance data defining a relationship between a count of sensor signal cycles and distance to an object to be detected;
- characterizing performance of the proximity sensor to develop sensor data defining a relationship between a count of cycles of a signal of the proximity sensor and distance to an object to be detected;
- deriving a function that specifies deviation of the sensor data from the reference performance data;
- specifying a reference distance value;
- employing the reference performance data and the reference distance value to define a threshold count value;
- thereafter, applying a stimulation pulse to a resonant circuit of the proximity sensor to generate an oscillating signal;
- counting cycles of the oscillating signal which exceed a predefined signal level, thereby producing a signal count;
- determining whether an object is present wherein such determination employs the function, the signal count and the threshold count value.

17. The method as recited in claim 16 wherein determining whether an object is present comprises:

employing the function to normalize the signal count, thereby producing a normalized count; and

comparing the normalized count to the threshold count value.

18. The method as recited in claim 17 wherein the function is a gain factor; and employing the function to normalize the signal count comprises multiplying the signal count by the gain factor.

19. The method as recited in claim 16 wherein determining whether an object is present comprises:

employing the function to convert the threshold value into an adjusted threshold; and

comparing the signal count to the adjusted threshold.

20. The method as recited in claim 16 wherein specifying a reference distance value comprises obtaining the reference distance value from another proximity sensor.